Dual-radiator RICH: update

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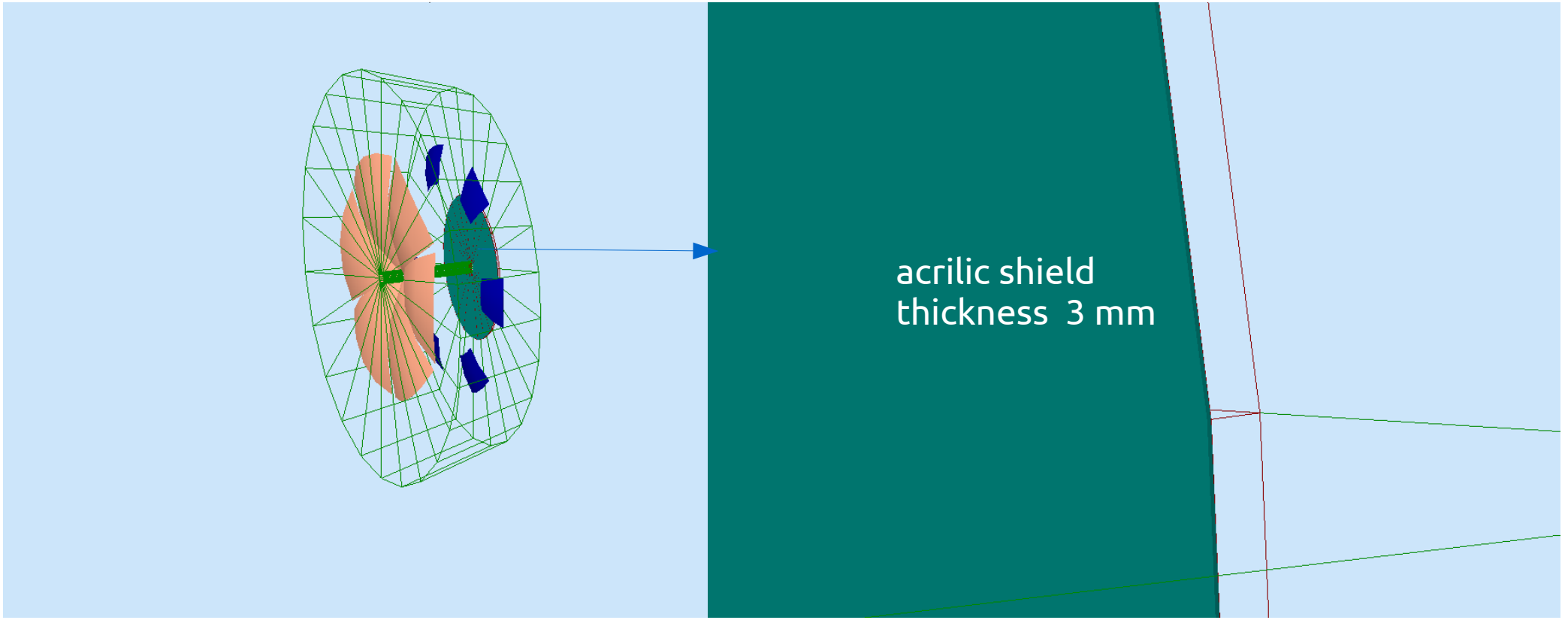
November 7, 2016

Study of the acrylic shield

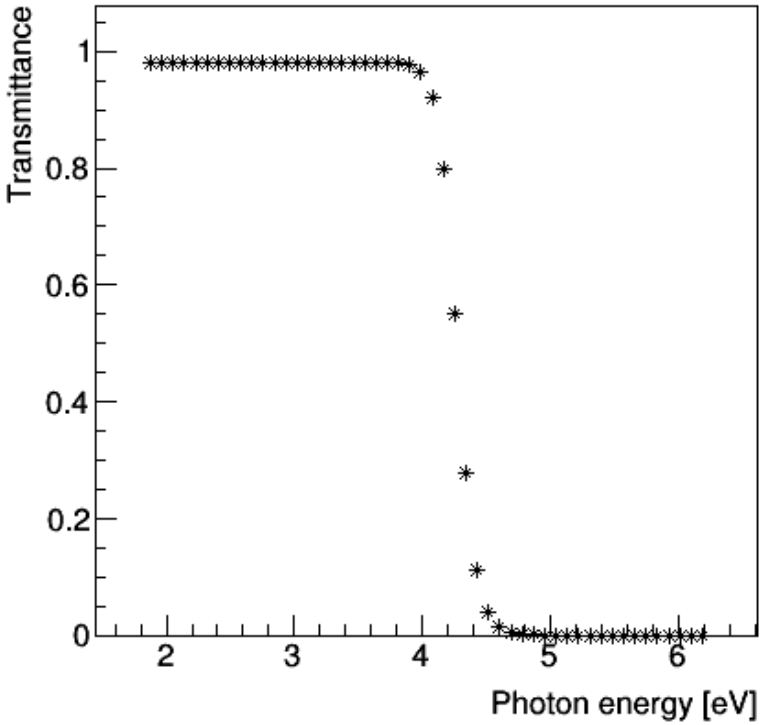
Aerogel and C_2F_6 dual-radiator RICH with a shield to separate the aerogel from the gas, and to filter photons below about 300 nm

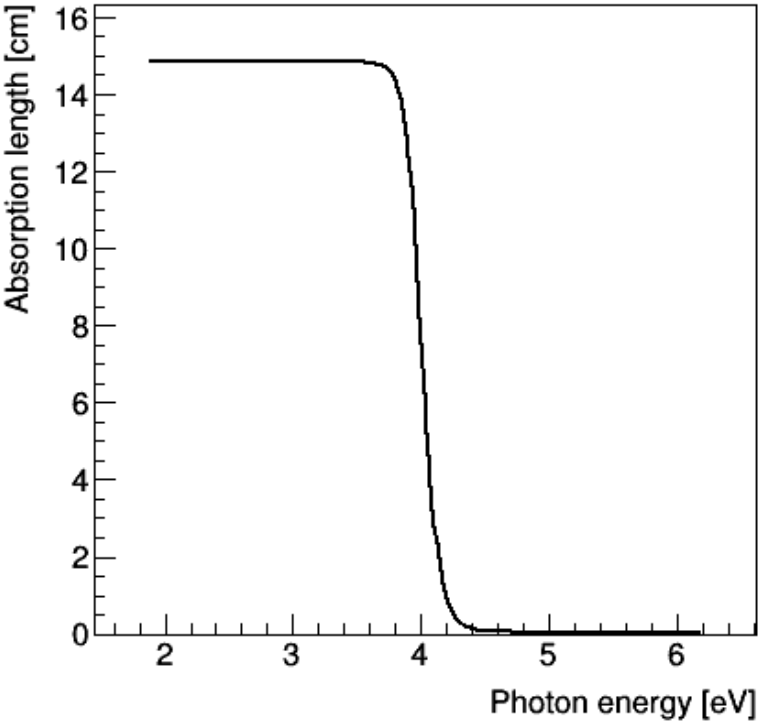


Transmittance and Absorption length

The Transmittance is defined by a sigmoid function (theoretical for the moment), and the Absorbtion length is

$A = d/\log T$ with d = 0.3 cm





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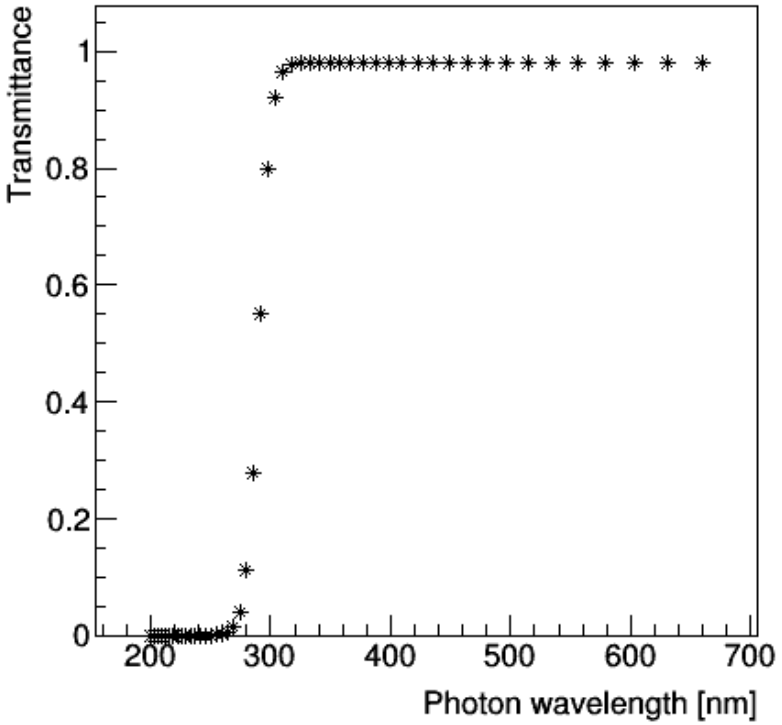
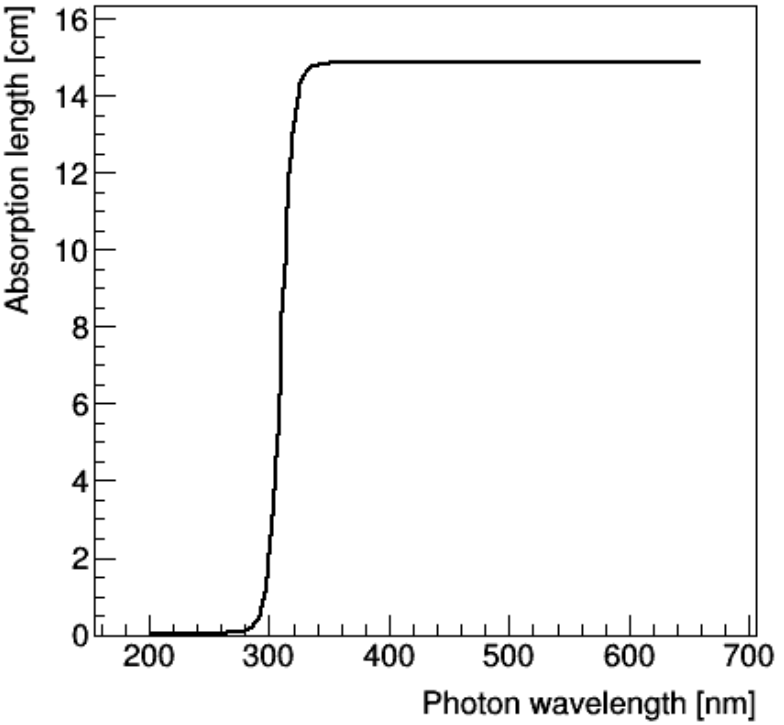
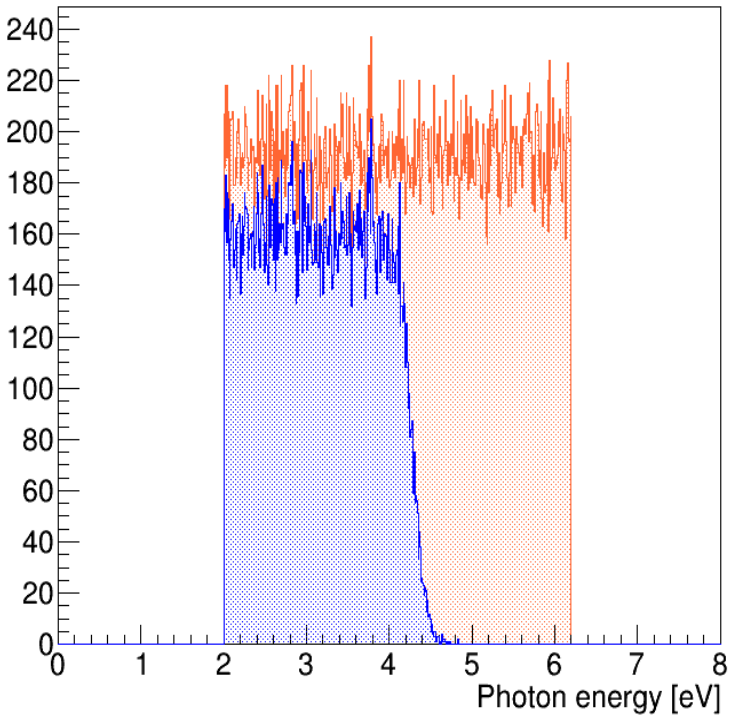
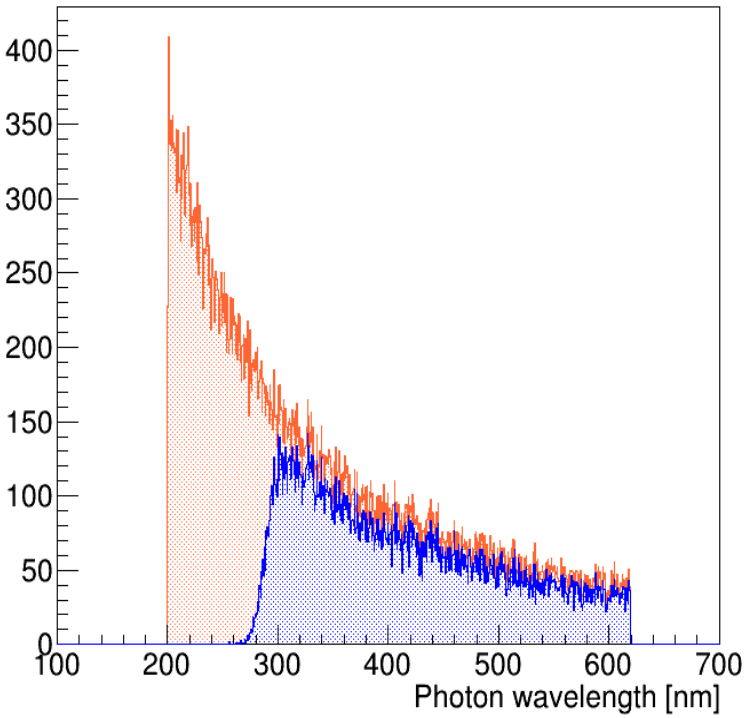




Filtered spectrum

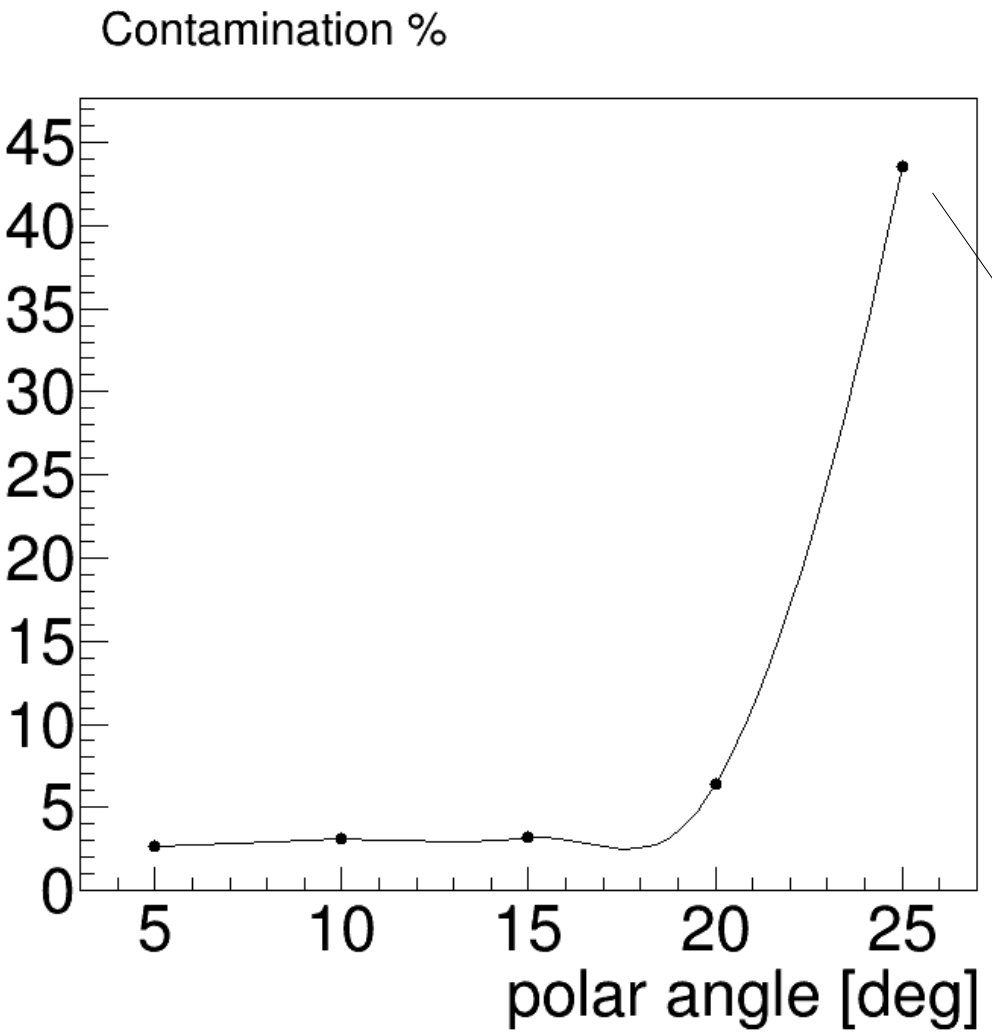
This is the effect of the shield on a beam of photons of E = [2,6.2] eV





With the shield there is an additional absorption of photons, even in the good range!
A trade off is needed!

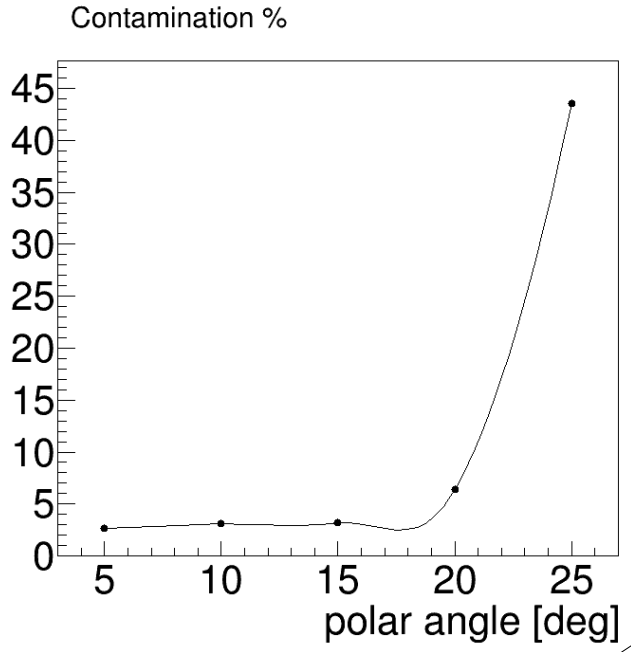
Shield & background for aerogel

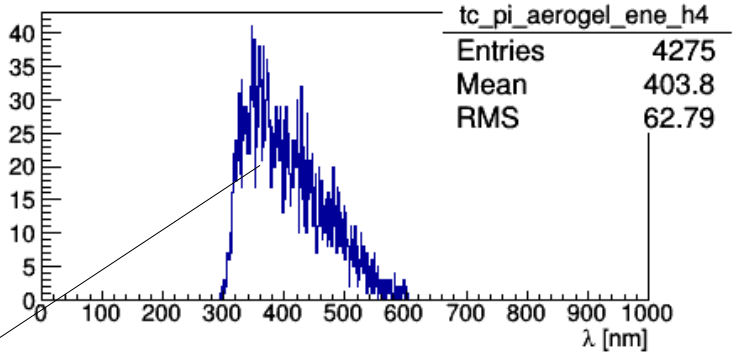


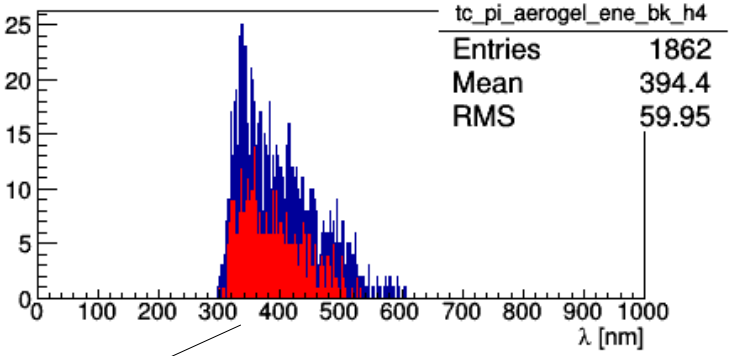
S/B % estimated reconstructing the angular distributions with the Inverse Ray Tracing alghoritm

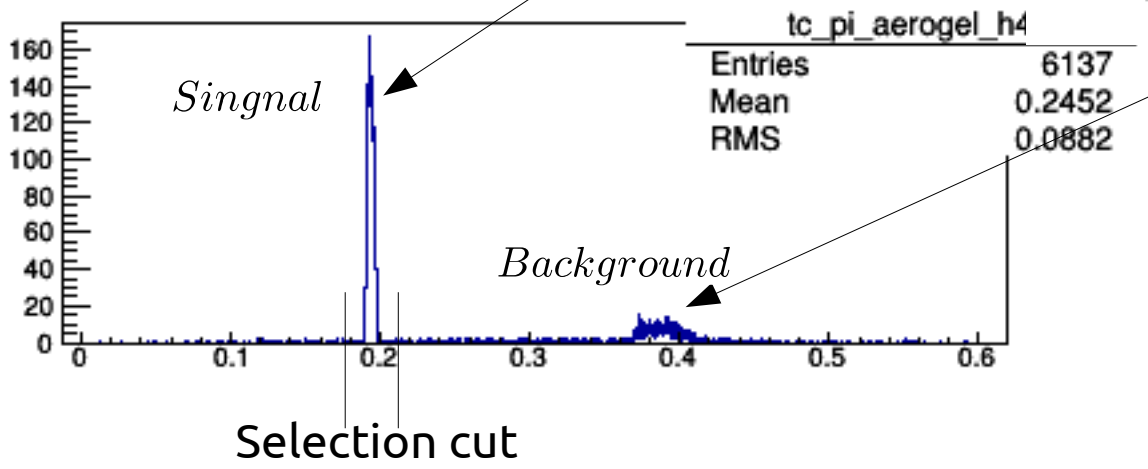
The background increase at polar angles higher than 20°!
Optical alignment?
Photons produced in the acrylic escape the edge?

Shield & background for aerogel









Comments and to do next

- Apply an absorber to the edge of the shield
- Study the reduction of N_{pe} for the aerogel with the shield

  - preliminary, about 1.5 less
- Study the error contributions with the shield
- Comparison of performances